REMARKS/ARGUMENTS

Claims 1-9 are pending.

Claims 2-9 have been amended.

Support for the amendments is found in the claims and specification, as originally filed.

Applicants amend the specification to correct an obvious clerical error and submit a new abstract to comply with the requirements of 37 C.F.R. § 1.72.

No new matter is believed to have been added.

Claims 1-5 and 8-9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite because the Examiner believes that it is not clear what pressure is referred to as "a charging pressure," e.g., a pressure under which a charging gas flows into a pressure vessel OR a pressure formed from the gas within the pressure vessel after the pressure vessel has been charged with the gas (see page 2 of the Official Action).

The term "charging pressure" is know in the art and means "working pressure." The present specification on page 3, lines 6-9, describe that standards of high pressure vessels are determined under the High Pressure Gas Safety Institute of Japan (KHK) S 1121. The International Standard for Gas Cylinders (ISO 11439) published in English submitted with this paper can be used as a reference. The term "charging (working) pressure" is the pressure to which a gas cylinder is pressurized (see, for example, ISO 11439), not the pressure of a charging gas that flows into a pressure vessel. Applicants request that the rejection be withdrawn.

Claims 1-9 are rejected under 35 U.S.C. 103(a) over Iida et al., US 6,190,481. The rejection is traversed because Iida et al. do not describe or suggest:

(a) an auto-frettage treatment, i.e., a distortion of the surface of the vessel body in a circumferential direction is 0.7-0.9%;

(b) a burst pressure being 2.2 to 2.8 times larger than a charging pressure;

(c) selecting ductility of 1.4-1.6% (claim 2); and

(d) selecting a strand elastic modulus of the reinforced fiber of 250 GPa or greater (claim 3).

The present specification describes that the claimed pressure vessel comprising reinforced fibers impregnated with a resin on the surface of the vessel, wherein the vessel undergoes an autofretttage treatment so that a distortion of the surface of the vessel body in a circumferential direction is 0.7-0.9%, and wherein a burst pressure is 2.2 to 2.8 times larger than a charging pressure, possess improved fatigue properties, bust properties, and reduced weight of the vessel.

Iida et al. describe a pressure vessel comprising an inner shell (e.g., aluminum alloy) and an outer shell comprising multiple layers of reinforcing fiber yarns (col. 4, lines 9-66; fig. 1-3; claim 1). The outer shell comprises hoop-wound layers and helically wounded layers (see col. 10, lines 11-16; col. 27, lines 35-38; fig. 3).

Iida et al. do not describe that after hardening the fiber reinforced resin layer, an auto-frettage treatment is conducted in which a distortion of the vessel surface in the circumferential direction is 0.7-0.9% (see claims 1 and 9) which provides excellent fatigue and burst properties (page 8, lines 9-12 of the present specification). Further, the present specification describes that the pressure vessel obtained by the claimed method has a burst pressure 2.2-2.8 times greater than a charging (working) pressure which is important for providing good fatigue and burst properties (see claims 1 and 9 and page 8, lines 14-23 of the present specification).

The Examples in the present specification show that if the distortion is higher (0.91%) or lower (0.68%) than that claimed and/or the burst pressure in outside of the claimed range, the vessel does not have a desired combination of fatigue properties, bust properties, and reduced weight (see Table 1 on page 21).

The Iida et al. vessel does not inherently have the claimed distortion and ratio of the burst and charging pressure because it is produced by a different method (without and auto-frettage treatment) and different reinforced fiber have different properties (see Table 1). The legal requirement for inherency is that "each and every time" the Iida et al. vessel is produced, it has the claimed properties. The fact that the vessel <u>may</u> have the claimed property is not sufficient.

Further, Iida et al. do not suggest selecting the claimed burst pressure and distortion.

The goal of Iida et al. is to produce a pressure vessel having light weight and maintaining pressure after repetitive impacts (col. 2, lines 13-18). This goal is achieved by using reinforced fibers and a resin, wherein a fiber strand tensile breaking strain is 2% or greater and the outer shell has tensile module of 35 GPa or greater and tensile breaking strain of 1.5% or greater.

Iida et al. do not recognize that fatigue properties, bust properties, and reduced weight is a function of a distortion of the vessel surface in the circumferential direction (an auto-frettage treatment) and a ratio of a burst pressure and a charging pressure. Therefore, one would not have been motivated to select the claimed distortion (i.e., to conduct auto-frettage treatment) and a ratio of a burst and a charging pressure because the burst pressure and distortion are not a result-effect variable.

Concerning claims 2 and 3, Iida et al. generally describe that the outer shell (obtained by impregnating a carbon fiber yarn with a resins and winding the reinforced fiber around the inner shell) has the tensile modulus (strand elastic modulus) of 35 GPa or greater and the

tensile breaking strain (ductility) of 1.5% or more (see claim 1 and col. 4-5, the bridging paragraph; Example 1, col. 25-26).

Iida et al. do not suggest selecting the specific claimed parameters, i.e., ductility of 1.4-1.6% and strand elastic modulus of the reinforced fiber of 250 GPa or greater.

In fact, in all Examples ductility (the tensile breaking strain) is 2% or higher (measured by the NOL ring testing method, see col. 26, lines 12-15; col. 27, lines 40-43). If the ductility is 1.2% (Comp. Example 1) or 1.6% (Comp. Example 2), the properties of the pressure vessel are inferior. Thus, Iida et al. teaches away from the claimed ductility of 1.4-1.6%.

Further, the maximum strand elastic modulus of the reinforced fiber is 80 GPa (Example 2, col. 27, line 42; other examples have even lower elastic modulus) (measured by the NOL ring testing method, see col. 26, lines 12-15; col. 27, lines 40-43). Iida et al. do not enable for the strand elastic modulus greater than 80 GPa.

Thus, Iida et al. do not make the claimed vessel obvious.

Applicants request that the rejection be withdrawn.

A Notice of Allowance for all pending claims is requested.

Respectfully submitted,

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